

Name: _____
PC: Difference Quotients

Date: _____

Difference quotient is an expression of the form:

$$\frac{f(x+h) - f(x)}{h}$$

It represents the slope of the line between two points, $(x, f(x))$ and $(x+h, f(x+h))$. It is going to be used in Calculus, so we need to get really comfortable with it.

1. Given $f(x) = 4x^2$, find the following and simplify.

(a). $f(x+h)$

(b). $f(x+h) - f(x)$

(c). $\frac{f(x+h) - f(x)}{h}$

2. Given $f(x) = 2x^2 - x$, find the following and simplify.

(a). $f(x+h)$

(b). $f(x+h) - f(x)$

(c). $\frac{f(x+h) - f(x)}{h}$

3. Given $f(x) = 9 - \frac{1}{2}x^2$, find the following and simplify.

(a). $f(x+h)$

(b). $f(x+h) - f(x)$

(c). $\frac{f(x+h) - f(x)}{h}$

4. Given $f(x) = 1 - x^2$, find and simplify $\frac{f(x+h) - f(x)}{h}$.

If you let $h = 0$, what does your answer become?

5. Given $C(x) = 2x^2 - 4x + 3$, find and simplify $\frac{C(x+h) - C(x)}{h}$

If you let $h = 0$, what does your answer become?

6. Given $p(q) = q^2 + 2q - 5$, find and simplify $\frac{p(q+h) - p(q)}{h}$

If you let $h = 0$, what does your answer become?